Amendments to the Claims:

This listing of the claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 (Original): A method of modifying a shock wave in a gas, comprising the steps of:

emitting energy along an extended path in the gas;

heating gas along the path to form a volume of heated gas expanding outwardly from the path; and

directing the path whereby the volume of heated gas passes through the shock wave and modifies the shock wave.

2 (Currently Amended): The method according to claim 1, wherein the energy is deposited along a stream line ahead of a bow-shock created by ~~the~~ a movement of a body through the gas.

3 (Currently Amended): The method according to claim 1, further comprising the step of changing ~~the~~ a direction of movement of a body through the gas.

4 (Currently Amended): The method according to claim 1, wherein the step of emitting the energy along the extended path reduces the density of the gas which is heated by the energy, thereby causing lateral movement of the gas away from a volume in the gas to which the ~~heating~~ energy is applied.

5 (Currently Amended): The method according to claim 1, wherein the step of emitting the energy along the extended path reduces the density of the gas which is heated ~~by the heating energy~~, thereby reducing drag on a body while the body maintains a non-zero angle of attack relative to the gas.

6 (Currently Amended): The method according to claim 1, wherein the step of emitting the energy along the extended path reduces the density of the gas which is heated ~~by the heating energy~~, thereby reducing the temperature on a portion of a body to reduce damage to the portion.

7 (Currently Amended): The method according to claim 1, wherein the step of emitting the energy along the extended path reduces the density of the gas which is heated ~~by the heating energy~~, thereby reducing the pressure on a portion of a body to reduce damage to the portion.

8 (Currently Amended): The method according to claim 1, further comprising the step of directing an amount of the gas into a propulsion system, wherein the step of heating the gas controls ~~the~~ an amount of ~~fluid~~ gas being directed into the propulsion system.

9 (Original): A method of reducing a shock wave in a gas, comprising the step of:

selectively discharging a heating energy in the gas ahead of the shock wave to form an extended heated path through the shock wave, wherein the heating of the gas simultaneously at different points forms the extended heated path.

10 (Currently Amended): The method according to claim 9, wherein the heated path is formed along a stream line ahead of a bow-shock created by ~~the~~ a movement of a body through the gas.

11 (Currently Amended): The method according to claim 9, further comprising the step of changing ~~the~~ a direction of movement of a body.

12 (Original): The method according to claim 9, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby causing lateral movement of the gas away from a volume in the gas to which the heating energy is applied.

13 (Original): The method according to claim 9, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing drag on a body while the body maintains a non-zero angle of attack relative to the gas.

14 (Original): The method according to claim 9, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing the temperature on a portion of a body to reduce damage to the portion.

15 (Original): The method according to claim 9, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing the pressure on a portion of a body to reduce damage to the portion.

16 (Original): The method according to claim 9, wherein the step of selectively discharging a heating energy in the gas further includes the steps of:

discharging an ionizing electromagnetic radiation in the gas to form a conductive path; and

discharging an electric discharge along the conductive path.

17 (Currently Amended): The method according to claim 16, wherein the ~~heated~~ conductive path is formed along a stream line ahead of a bow-shock created by ~~the~~ a movement of a body through the gas.

18 (Currently Amended): The method according to claim 16, further comprising the step of changing ~~the~~ a direction of movement of a body.

19 (Original): The method according to claim 16, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby causing lateral movement of the gas away from a volume in the gas to which the heating energy is applied.

20 (Original): The method according to claim 16, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing drag on a body while the body maintains a non-zero angle of attack relative to the gas.

21 (Original): The method according to claim 16, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing the temperature on a portion of a body to reduce damage to the portion.

22 (Original): The method according to claim 16, wherein the step of discharging the heating energy reduces the density of the gas which is heated by the heating energy, thereby reducing the pressure on a portion of a body to reduce damage to the portion.

23 (Currently Amended): A method of reducing a shock wave in a fluid by selectively discharging a heating energy in the ~~gas~~ fluid ahead of the shock wave to form an extended heated path through the shock wave, comprising the steps of:

discharging an ionizing electromagnetic radiation in the ~~gas~~ fluid to form a conductive path, the ionizing electromagnetic radiation including UV laser pulses, visible laser pulses, IR laser pulses, and/or combinations thereof; and

discharging energy along the conductive path, the energy different from the ionizing electromagnetic radiation, wherein

the extended heated path is formed by the heating of the ~~gas~~ fluid simultaneously at different points.

24 (Original): The method according to claim 23, wherein the energy is an electric discharge.

25 (Original): The method according to claim 23, wherein the energy is microwave energy.

26 (Original): The method according to claim 23, wherein the energy is laser energy.

27 (Original): The method according to claim 23, wherein the fluid is a gas.

28 (Original): An apparatus on a body moving through a fluid for modifying a shock wave formed in the fluid by the body, comprising:

means for emitting energy along an extended path in the fluid; and

means for heating fluid along the path to form a volume of heated fluid expanding outwardly from the path, wherein the means for emitting energy includes a filamenting laser and a microwave emitter;

whereby the volume of heated fluid passes through the shock wave to modify the shock wave.

29 (Original): A method of decreasing drag of a body passing subsonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body, and

the heating of the fluid at different points along the path occurs simultaneously.

30 (Original): The method according to claim 29, wherein electromagnetic energy heats the fluid along the path.

31 (Original): The method according to claim 29, further comprising the step of repeating said steps of emitting energy, heating fluid, and directing the path.

32 (Original): The method according to claim 29, wherein multiple paths are formed within the fluid.

33 (Original): A method of decreasing drag of a body passing subsonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body, and wherein the fluid includes a liquid.

34 (Original): A method of decreasing drag of a body passing subsonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path;

actively changing a direction of the path through the fluid; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body.

35 (Original): The method according to claim 34, wherein the step of heating the fluid causes lateral movement of the fluid away from an area in the fluid to which the energy is applied.

36 (Original): A method of steering a body traveling subsonically through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to form a volume of heated fluid expanding outwardly from the path;

directing the path to asymmetrically change pressures exerted against the body, thereby steering the body.

37 (Original): A projectile having a body, comprising:

a propulsion system;

an inlet for the propulsion system;

means for emitting energy along an extended path in a gas ahead of the projectile; and

means for heating fluid along the path to form a volume of heated fluid expanding outwardly from the path, wherein the means for heating fluid controls an amount of fluid entering the inlet.

38 (Original): The projectile according to claim 37, wherein the propulsion system is a scramjet.

39 (Original): The projectile according to claim 37, wherein the propulsion system is a turbine engine.

40 (Original): The projectile according to claim 37, wherein the inlet is symmetrically positioned around the body.

41 (Original): The projectile according to claim 37, wherein the inlet is non-symmetrically positioned on the body.

42 (Original): The projectile according to claim 37, wherein the means for emitting energy includes an aerodynamic window.

43 (Original): A method of decreasing drag of a body passing transonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body, and

the heating of the fluid at different points along the path occurs simultaneously.

44 (Original): The method according to claim 43, wherein electromagnetic energy heats the fluid along the path.

45 (Original): The method according to claim 43, further comprising the step of repeating said steps of emitting energy, heating fluid, and directing the path.

46 (Original): The method according to claim 43, wherein multiple paths are formed within the fluid.

47 (Original): A method of decreasing drag of a body passing transonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body, and wherein the fluid includes a liquid.

48 (Original): A method of decreasing drag of a body passing transonically along a direction through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path;

actively changing a direction of the path through the fluid; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body.

49 (Original): The method according to claim 48, wherein the step of heating the fluid causes lateral movement of the fluid away from an area in the fluid to which the energy is applied.

50 (Original): A method of steering a body traveling transonically through a fluid, comprising the steps of:

emitting energy along an extended path in the fluid;

heating fluid along the path to form a volume of heated fluid expanding outwardly from the path;

directing the path to asymmetrically change pressures exerted against the body, thereby steering the body.

51 (Original): An apparatus on a body moving through a fluid for modifying flow of the fluid, comprising:

means for emitting energy along an extended path in the fluid;

means for heating fluid along the path to form a volume of heated fluid expanding outwardly from the path, and

an aerodynamic, window,

whereby the energy is directed through the aerodynamic window to heat the fluid and modify the flow.

52 (Original): A method of decreasing drag of a body passing along a direction through a fluid, comprising the steps of:

emitting energy through an aerodynamic window along an extended path in the fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path; and

directing the path parallel to the direction the body passes through the fluid,

wherein the body passes through the volume of decreased-density heated fluid and whereby the reduction of density of the fluid decreases the drag on the body, and

the heating of the fluid at different points along the path occurs simultaneously.

53 (New): The method according to claim 29, wherein said energy is emitted from said body.

54 (New): The method according to claim 33, wherein said energy is emitted from said body.

55 (New): The method according to claim 34, wherein said energy is emitted from said body.

56 (New): The method according to claim 43, wherein said energy is emitted from said body.

57 (New): The method according to claim 47, wherein said energy is emitted from said body.

58 (New): The method according to claim 48, wherein said energy is emitted from said body.

59 (New): The method according to claim 52, wherein said energy is emitted from said body.

60 (New): A method of forming a channel in a fluid, comprising the steps of:

emitting energy along an extended path in the fluid, wherein said energy is emitted from a body moving subsonically through said fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path to create a channel of decreased-density heated fluid; and

directing the path parallel to the direction the body moves through the fluid,

wherein the body moves through the channel, and

the heating of the fluid at different points along the path occurs simultaneously.

61 (New): The method according to claim 60, wherein the fluid includes a liquid.

62 (New): A method of forming a channel in a fluid, comprising the steps of:

emitting energy along an extended path in the fluid, wherein said energy is emitted from a body moving subsonically through said fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path to create a channel of decreased-density heated fluid;

actively changing a direction of the path through the fluid; and

directing the path parallel to the direction the body moves through the fluid, wherein the body moves through the channel.

63 (New): A method of forming a channel in a fluid, comprising the steps of:

emitting energy along an extended path in the fluid, wherein said energy is emitted from a body moving transonically through said fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path to create a channel of decreased-density heated fluid; and

directing the path parallel to the direction the body moves through the fluid,

wherein the body moves through the channel, and

the heating of the fluid at different points along the path occurs simultaneously.

64 (New): The method according to claim 60, wherein the fluid includes a liquid.

65 (New): A method of forming a channel in a fluid, comprising the steps of:

emitting energy along an extended path in the fluid, wherein said energy is emitted from a body moving transonically through said fluid;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path to create a channel of decreased-density heated fluid;

actively changing a direction of the path through the fluid; and

directing the path parallel to the direction the body moves through the fluid, wherein the body moves through the channel.

66 (Original): A method of forming a channel in a fluid, comprising the steps of:

emitting energy through an aerodynamic window along an extended path in the fluid, wherein said energy is emitted from a moving body;

heating fluid along the path to decrease the density of fluid around the path and to form a volume of heated fluid expanding outwardly from the path to create a channel of decreased-density heated fluid; and

directing the path parallel to the direction the body moves through the fluid,

wherein the body moves through the channel, and

the heating of the fluid at different points along the path occurs simultaneously.

67 (New): A method of forming a channel in a gas, comprising the steps of:

emitting energy from a moving body along an extended path in the gas; and

heating gas along the path to form a volume of heated gas expanding outwardly from the path.

68 (New): The method according to claim 67, wherein the step of emitting energy along an extended path in the gas includes the step of:

discharging an ionizing electromagnetic radiation in the gas to form a conductive path.

69 (New): The method according to claim 68, wherein the step of discharging an ionizing electromagnetic radiation comprises providing pulses of said radiation.

70 (New): The method according to claim 68, wherein the step of heating gas along an extended path in the gas includes the step of:

discharging an electric discharge along the conductive path.

71 (New): The method according to claim 67, wherein the step of heating gas along an extended path reduces the density of the gas which is heated, thereby causing lateral movement of the gas away from a volume in the gas to which the heating is applied.

72 (New): A method of forming a channel in a fluid by selectively discharging from a moving body a heating energy in the fluid to form a channel through the fluid, comprising the steps of:

discharging an ionizing electromagnetic radiation in the fluid to form a conductive path, the ionizing electromagnetic radiation including UV laser pulses, visible laser pulses, IR laser pulses, and/or combinations thereof; and

discharging energy along the conductive path, the energy different from the ionizing electromagnetic radiation, wherein

the ionizing electromagnetic radiation is discharged, and the channel is formed by the heating of the fluid simultaneously at different points.

73 (New): The method according to claim 72, wherein the energy is an electric discharge.

74 (New): The method according to claim 72, wherein the energy is microwave energy.

75 (New): The method according to claim 72, wherein the energy is laser energy.

76 (New): The method according to claim 72, wherein the fluid is a gas.

Election

Noting the Office Action of March 15, 2005 wherein restriction has been required, Applicant hereby elects Group III (claims 29-35, 43-49, and 52) with traverse for prosecution in the above-identified application. In addition, Applicant respectfully submits that new method claims 53-76 should be grouped with the method claims of Invention III (claims 29-35, 43-49, and 52) and be examined on the merits.

New claims 53-59 depend from elected claims 29, 33, 34, 43, 47, 48, and 52, respectively. New claims 60-76 are all directed to methods involving moving bodies and therefore should be grouped with the claims of Group III and examined on the merits.

The restriction is traversed. According to MPEP § 803, "[i]f the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions." A comprehensive search of any group would necessarily include classes and subclasses containing the unelected groups. In addition, Applicant notes that the Examiner examined all the claims of related application (U.S. Pat. App. Ser. No. 09/867,752, now U.S. Patent No. 6,527,221) on the merits, without imposing a restriction requirement, while the `752 application also included claims directed to methods and apparatuses. Therefore, Applicant submits that examination of all the claims on the merits would not impose a serious burden on the Examiner.